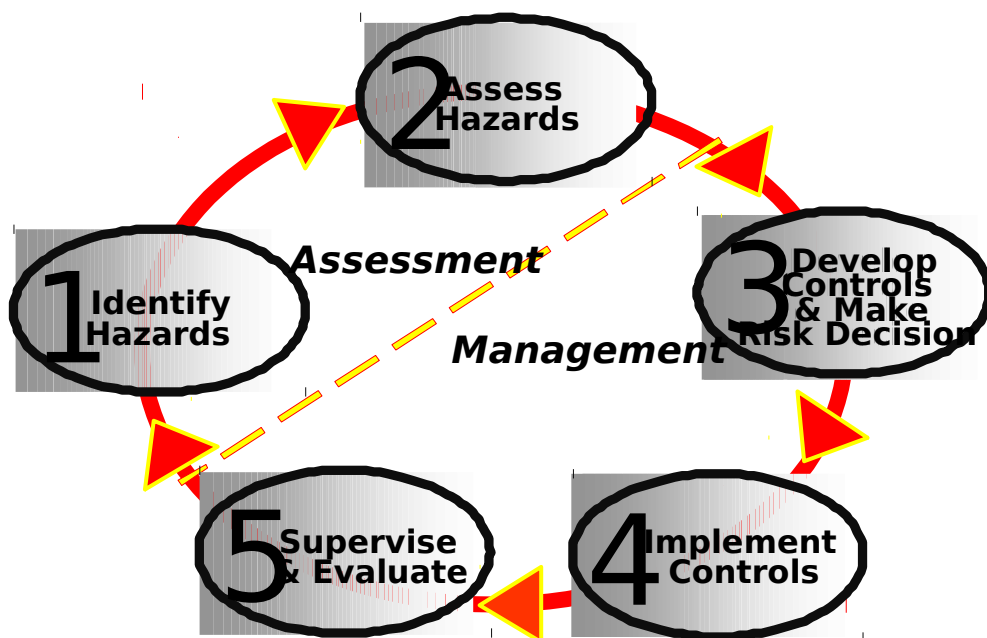




Composite Risk Management for Heat Injury Prevention, Identification, and Response *FY 2010*



Identify Hazards	1
Assess Hazards	2
Heat Injury Risk Management Matrix	
Develop Controls	3/4
Education	
Planning	
Identification of Previous Injuries	
Hydration Monitoring System	
Fluid Replacement and Work/Rest Guides	
Implement Controls	5
Supervise and Evaluate	6/7
Warning Signs and Symptoms	

2 Assess Hazards

- When ambient temperature is over 75° F, constantly assess the **heat category** using Wet Bulb Globe Temperature (WBGT). The last category measured remains in effect until 0600 the following day.
- Know your Soldiers! Early identification of Soldiers who will be at increased risk based on **individual risk factors is critical**.
- Check **hydration status** constantly. Start to hydrate the day before a strenuous activity is scheduled. Give extra fluid at night and in the morning if hydration is inadequate.
 - Use Ogden cords and monitor constantly
 - Ask about urine color. Urine is clear when properly hydrated
- Assess the overall heat injury risk** daily (use risk matrix and incorporate into Composite Risk Management Worksheet).

Heat Injury Risk Management Matrix

Scores assigned to different conditions based on risk for developing a heat injury.
This scoring system: 0= Low risk; 1=Medium risk; 2=High risk; 3=Extreme risk

RISK FACTORS	Level of Risk (For each Factor Circle the Appropriate Condition)			
	0	1	2	3
Risk Management Worksheet	All control measures implemented			Not all control measures implemented
Heat (WBGT at site)	(Less than Category 1)	Category 1	Category 2 and 3	Category 4 and 5
No. Sequential Days Heat Cat 5	0	1	2-3	≥4
Heat Injuries in the unit in Past 2 Days	None	Heat Cramps	Heat Exhaustion	Heat Stroke*
Work in Past Three Days (see below)	Easy	Easy	Moderate	Hard
Projected Work for the Present Day	Easy	Easy	Moderate	Hard
Heat Acclimatization Days	>13	7-13	3-6	<3
Leader/Cadre Presence	Full time	Substantial	Minimal	None
Length of Duty Time of Cadre	18 Months	7-18 Months	1-6 Month	< 1 Month
Communication System	Radio and Phone	Phone Only	Radio Only	None
Rest in Previous 24 Hours	> 7 Hours	5-7 Hours	2-4 Hours	< 2 Hours
Cumulative score: 25-33 = extreme risk, 16-24 = high risk, 7-15 = medium risk, 0-6 = low risk.				

* If Heat Stroke has occurred in unit in past 2 days, risk level= extreme risk

Easy Work	Moderate Work	Hard Work
- Weapon Maintenance - Walking Hard Surface at 2.5 mph, < 30 lb Load - Marksmanship Training - Drill and Ceremony	- Walking Loose Sand at 2.5 mph, no Load - Walking Hard Surface at 3.5 mph, < 40lb Load - Calisthenics - Patrolling - Individual Movement Techniques. i.e. low crawl, high crawl	- Walking Hard Surface at 3.5 mph, ≥ 40 lb Load - Walking Loose Sand at 2.5 mph with Load - Field Assaults

WHEN IN DOUBT? - 911 & Ice!

Develop Controls

Education

- Provide heat injury prevention, identification, and response training for all personnel, including IET Soldiers.
- Ensure all cadre receive heat injury prevention, identification, and response training by 15 April of each year, or as soon as possible after arrival.
- Ensure all bulletin boards have Heat Casualty Prevention posters and all leaders have Heat Casualty Prevention tools. Heat Injury Prevention posters and tools are available in the Heat Injury Prevention Information Paper located at:
<https://www.us.army.mil/suite/folder/21396969>

Planning

- Update the Composite Risk Assessment as conditions warrant, but daily as a minimum. Adjust the training schedule to minimize consecutive days of heavy physical training, especially if other heat stressors exist (e.g. heat exposure and/or lack of quality sleep)
- Employ at least two forms of communications and provide iced bed sheets (at least two sheets per platoon – four sheets per platoon is better).
- Plan and provide adequate hydration for *all* personnel (including Cadre).
- When planning training events, keep in mind:
 1. Time of day the training is conducted – morning is cooler
 2. Location of training
 - Sun vs. Shade. Train and rest in shade.
 - Open vs. Protection from wind - wind has cooling effect.
 - Open up the formation to decrease heat strain.
 3. Clothing
 - Heavy, restrictive vs. Loose, lightweight
 4. Where in training cycle
 - Most Heat Casualties occur in the 2nd or 3rd week of initial training.
 - Acclimatization takes 10-14 days, depending on the physical condition of the Soldier.
- After moderate to hard work in heat category 3 or higher, take cold showers at the end of the day.

Identification

- Identify prior heat injuries with color-coded beads (see below):

Hydration Monitoring System

- Identify Soldiers who are at greater risk for heat injury. Soldiers will use Ogden cords to identify previous heat injuries and monitor hydration. Soldiers pull one bead each time they finish a canteen (1 qt) of water or three beads each time they empty a personal hydration system.

ACU, IBA, LBV:

Each bead = One quart of water consumed

- **Black= No issues**
- **Red= Heat Injury**
- **Blue= Cold Injury**
- **Yellow= Allergy**



3

Develop Controls continued

Fluid Replacement and Work/Rest Guide

Acclimatized (after approx two weeks training) Wearing ACUs

Heat Category	WBGT Index, (F°)	Easy Work		Moderate Work		Hard Work	
		Work/Rest	Water Intake (Qt/h)	Work/Rest	Water Intake (Qt/h)	Work/Rest	Water Intake (Qt/h)
1	78-81.9	NL	½	NL	¾	40/20 min	¾
2 (Green)	82-84.9	NL	½	50/10 min	¾	30/30 min	1
3 (Yellow)	85-87.9	NL	¾	40/20 min	¾	30/30 min	1
4 (Red)	88-89.9	NL	¾	30/30 min	¾	20/40 min	1
5 (Black)	>90	50/10 min	1	20/40 min	1	10/50 min	1

- The work-rest times and fluid replacement volumes will sustain performance and hydration for at least 4 h of work in the specified heat category. Fluid needs can vary based on individual differences ($\pm \frac{1}{4}$ qt/h) and exposure to full sun or full shade ($\pm \frac{1}{4}$ qt/h).
- NL= no limit to work time per hour.
- Rest means minimal physical activity (sitting or standing), accomplished in shade if possible.
- CAUTION:** Hourly fluid intake should not exceed 1½ quarts.
- Daily fluid intake **should not exceed 12 quarts.**
- If wearing IBA, Pugil or Combatives protective equipment, add **5°F** to WBGT
- If wearing NBC clothing (mission-oriented protective posture (MOPP 4)), add **10°F** to WBGT index for easy work, and **20°F** to WBGT index for moderate and hard work.

Easy Work = Walking hard surface 2.5 mph <30# load, Weapon maintenance, Marksmanship training

Moderate Work = Patrolling, Walking on sand at 2.5 mph with no load, Calisthenics

Hard Work = Walking on sand at 2.5 mph w/load, Field assaults

Continuous Work Duration and Fluid Replacement Guide

Acclimatized (after approx two weeks training) Wearing ACUs

This guide is accurate only for trainees with no previous heat injury or dehydration prior to this activity. and who will have several hours of rest

Heat Category	WBGT Index, (F°)	Easy Work		Moderate Work		Hard Work	
		Work (min)	Water Intake (Qt/h)	Work (min)	Water Intake (Qt/h)	Work (min)	Water Intake (Qt/h)
1	78-81.9	NL	½	NL	¾	70	1
2 (Green)	82-84.9	NL	½	150	1	65	1 ¼
3 (Yellow)	85-87.9	NL	¾	100	1	55	1 ¼
4 (Red)	88-89.9	NL	¾	80	1 ¼	50	1 ¼
5 (Black)	>90	180	1	70	1 ½	45	1 ½

- NL can sustain work for at least 4 hours in the specified heat category.
- Fluid needs can vary based on individual differences ($\pm \frac{1}{4}$ qt/hr) and exposure to full sun or full shade ($\pm \frac{1}{4}$ qt/hr).

WHEN IN DOUBT? - 911 & Ice!

4 Implement Controls



Decision to accept risk is made at the appropriate level

- Made in accordance with Risk Decision Authority outlined in TRADOC Regulation 350-6, page 56, para 3-28.



Identified controls are in place

- Update WBGT hourly when ambient temperature is 75°F or higher. Last heat category measured remains in effect until 0600 the following day.
- Adhere to work/rest cycle in high heat categories. Rest in shade. For tasks requiring continuous effort, adhere to guideline and allow extended rest afterwards.
- Ensure each training event incorporates good prior planning. Update Risk Assessments daily and ensure that iced sheets, Combat Lifesaver bags, and effective communications are readily available and in sufficient quantities.



Monitor and enforce hydration standard

- Hydrate frequently, but do not exceed **1 ½** quarts per hour or **12** quarts per day. Hydration fluids are best absorbed when cold.
- Do not allow Soldiers to empty canteens to lighten load (consider imposing a penalty in timed events).
- Ensure Soldiers are well hydrated before training. Ask about urine; urine is clear if well hydrated. Check Ogden Cords frequently.



Monitor and enforce eating meals

- Ensure all meals are eaten during the meal break and that Soldiers have adequate time to consume meals and fluids.
- Table salt may be added to food when the heat category is high. Salt tablets are *not* recommended.



Execute random checks

- Spot checks, including mental status checks, by Cadre.
- Enforce battle buddy checks – need to be aware of each other's eating, drinking and frequency of urination.
- Plan placement of leaders to observe and react to heat injuries in dispersed training.



Follow clothing recommendations

- Heat category 1-2: no restrictions
- Heat category 3: Unblouse trouser legs, unbuckle web belt
- Heat category 4-5:
 - Unblouse trouser legs, unbuckle web belt
 - Remove t-shirt from under ACU top or remove ACU top down to T-shirt (depends whether biting insects are present)
 - Remove helmets unless there are specific safety reasons to keep them on (e.g.: range).
- MOPP 4: Add **10°F** to WBGT index for easy work, and **20°F** to WBGT index for moderate to hard work. **5°F** for IBA, Pugil and Combatives

protective equipment.

WHEN IN DOUBT? - 911 & Ice!

5 Supervise & Evaluate

- Enforce SOPs. Ensure a Risk Assessment has been completed, signed, and updated daily. Delegate authority to ensure control measures have been implemented. Monitor adequacy/progress of implementation of control measures.
- Conduct spot checks of cadre. Do cadre know the current heat category? Are cadre implementing work/rest/fluid cycles? Make on-the-spot corrections. Lead by example.
- Conduct spot checks of Soldiers. Ask Soldiers questions while observing their mental status and physical capabilities. Look out for common signs and symptoms which can rapidly progress to serious signs and symptoms. Ask Soldiers when did they last urinate and was their urine clear?
- If 1-2 Soldiers become heat casualties, stop all training and evaluate each Soldier for early signs and symptoms of becoming a heat casualty.
- When controls fail, heat injuries occur. Recognizing the early signs of heat injury is critical. Take immediate action if any heat injuries are observed or suspected. Stop-rest-cool then evaluate in accordance with warning signs and symptoms. If in doubt, evacuate.

Warning Signs and Symptoms of Heat Casualty and Water Intoxication

Indications of possible Heat Injury

<u>Common Signs / Symptoms</u>	<u>Immediate Actions</u>
• Dizziness • Headache • Nausea • Weakness or fatigue • Muscle cramps	• Remove from training • Allow casualty to rest in shade • Loosen clothing • Give sips of water • Cadre member monitors Soldier constantly
<u>Serious Signs / Symptoms</u>	<u>Immediate Actions</u>
• Hot body, high temperature • Confusion, agitation (Mental Status Assessment) • Unsteady walk • Vomiting • Involuntary bowel movement • Convulsions • Weak or rapid pulse • Unresponsiveness, coma	• CALL 911 • Lay person in shade with feet elevated • Remove clothing • Wrap in iced sheets • Pour cold water over casualty and fan. • Give <u>sips</u> of water while waiting for the ambulance (if conscious) • Same cadre member monitors Soldier until ambulance arrives

Call 911 if any of the following exist:

- **Signs or symptoms of a heat injury or**
- **Mental status change or**
- **When in doubt**



WHEN IN DOUBT? - 911 & Ice!

5 Supervise & Evaluate continued

Signs of possible Water Intoxication (Over Hydration)

Signs and Symptoms

Confusion
Weakness
Vomiting

What to do:

Ask these questions to the soldier or battle buddy:

1. Has Soldier been eating? Check rucksack for # of MRE's left.
2. Has Soldier been drinking a lot? (suspect water intoxication if soldier has been drinking constantly).
3. How often has Soldier urinated? (frequent urination seen with water intoxication; infrequent urination with heat illness)

4. What color is urine? (Clear urine may indicate over hydration)
If Soldier has been eating, drinking and urinating a lot, yet has these symptoms, call 911

Mental Status Assessment

An important sign that the Soldier is in a **serious life-threatening** condition is the presence of mental confusion (with or without increased temperature). Anyone can do a mental status assessment by asking some simple questions.

What is your name?

(Does not know their name.)

What month is it? What year is it?

(Does not know the month or year.)

Where are we/you?

(Is not aware of location or surroundings.)

What were you doing before you became ill?

(Does not know the events that led to the present situation.)

When to evacuate

Call 911 if any of the following exist:

Signs or symptoms of a heat injury

or

Mental status change

or

When in doubt

WHEN IN DOUBT? - 911 & Ice!

Emergency Evacuation Protocol

Senior person on the scene will

- Initiate Emergency Response via the following means:
 - ✓ **Primary: 911 via telephone**
 - ✓ Alternate 1: Range Control via radio
 - ✓ Alternate 2: Range Control at _____
 - ✓ Alternate 3: Military Police Desk at _____
- Implement emergency lifesaving and evacuation measures to preserve the loss of life, limb, and eyesight.
- Assume command and control of the accident scene until arrival of the appropriate emergency response agency.
- Assist emergency efforts as directed by emergency personnel.
- Retain Command and control of unit throughout emergency.
- Provide constant monitoring of the injured Soldier by the same Cadre member.

It may be tempting to transport an injured Soldier with a unit vehicle or POV.

Call 911 instead.

That brings you a rapid response package with trained personnel who can stabilize the patient and decide what medical treatment facility can provide the best possible care for the injured Soldier .

Installation Emergency Services are there to support you.

Never hesitate to call.

WHEN IN DOUBT? - 911 & Ice!

Call 911 if any of the following exist:

Signs or symptoms of a heat injury

or

Mental status change

or

RISK ASSESSMENT MATRIX

Probability						
Severity		Frequent A	Likely B	Occasional C	Seldom D	Unlikely E
Catastrophic	I	E	E	H	H	M
Critical	II	E	H	H	M	L
Marginal	III	H	M	M	L	L
Negligible	IV	M	L	L	L	L
- Extremely High		H - High		M - Moderate		L - Low

Mission First - Safety Always